

Express Mail No. ET069433584US

FORM PTO-1390 (REV. 11-2000)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER  <b>PRIGENT1</b>	
<b>TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371</b>				U.S. APPLICATION NO. (If known, see 37 CFR 1.5) <b>10/088440</b>	
INTERNATIONAL APPLICATION NO. <b>PCT/FR00/02492</b>		INTERNATIONAL FILING DATE <b>8 September 2000</b>		PRIORITY DATE CLAIMED <b>15 September 1999</b>	
TITLE OF INVENTION <b>REMOTE CONTROL SYSTEM FOR AT LEAST AN ELECTRICAL APPARATUS, AND MODULES COMPONENT MODULES OF SAID SYSTEM</b>					
APPLICANT(S) FOR DO/EO/US <b>PRIGENT, Erven</b>					
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:					
1. <input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. 371. 2. <input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. 371. 3. <input checked="" type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below. 4. <input checked="" type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31). 5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) a. <input type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau). b. <input checked="" type="checkbox"/> has been communicated by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). 6. <input checked="" type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)). a. <input checked="" type="checkbox"/> is attached hereto. b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4). 7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau). b. <input type="checkbox"/> have been communicated by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input checked="" type="checkbox"/> have not been made and will not be made. 8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)). 9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). (unsigned) 10. <input type="checkbox"/> An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).  <b>Items 11 to 20 below concern document(s) or information included:</b> 11. <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98. 12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. 13. <input checked="" type="checkbox"/> A <b>FIRST</b> preliminary amendment. 14. <input type="checkbox"/> A <b>SECOND</b> or <b>SUBSEQUENT</b> preliminary amendment. 15. <input type="checkbox"/> A substitute specification. 16. <input type="checkbox"/> A change of power of attorney and/or address letter. 17. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825. 18. <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4). 19. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4). 20. <input checked="" type="checkbox"/> Other items or information: <b>Drawings (6 sheets) Abstract Express Mail Transmittal Postcard Receipt</b>					

JC13 Rec'd PCT/PTO 15 MAR 2002

U.S. APPLICATION NO. (if known, see 37 CFR 1.53) <b>107 088440</b>	INTERNATIONAL APPLICATION NO. <b>PCT/FR00/02492</b>	ATTORNEY'S DOCKET NUMBER <b>PRIGENT1</b>
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21. <input checked="" type="checkbox"/> The following fees are submitted: <b>BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):</b> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO. ....  International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO .....  International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO .....  International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) .....  International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) ..... <b>ENTER APPROPRIATE BASIC FEE AMOUNT =</b>	<b>CALCULATIONS PTO USE ONLY</b>																									
	\$ 890.00																									
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	\$ 130.00																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 20%;">CLAIMS</th> <th style="width: 20%;">NUMBER FILED</th> <th style="width: 20%;">NUMBER EXTRA</th> <th style="width: 20%;">RATE</th> <th style="width: 20%;"></th> </tr> <tr> <td>Total claims</td> <td>29 - 20 =</td> <td>9</td> <td>x \$18.00</td> <td>\$ 162.00</td> </tr> <tr> <td>Independent claims</td> <td>1 - 3 =</td> <td>0</td> <td>x \$80.00</td> <td>\$</td> </tr> <tr> <td colspan="3">MULTIPLE DEPENDENT CLAIM(S) (if applicable)</td> <td>+ \$270.00</td> <td>\$</td> </tr> <tr> <td colspan="4"><b>TOTAL OF ABOVE CALCULATIONS =</b></td> <td>\$ 1,182.00</td> </tr> </table>	CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		Total claims	29 - 20 =	9	x \$18.00	\$ 162.00	Independent claims	1 - 3 =	0	x \$80.00	\$	MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$270.00	\$	<b>TOTAL OF ABOVE CALCULATIONS =</b>				\$ 1,182.00	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE																							
Total claims	29 - 20 =	9	x \$18.00	\$ 162.00																						
Independent claims	1 - 3 =	0	x \$80.00	\$																						
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$270.00	\$																						
<b>TOTAL OF ABOVE CALCULATIONS =</b>				\$ 1,182.00																						
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.	\$ 591.00																									
<b>SUBTOTAL =</b>	\$ 591.00																									
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).	\$																									
<b>TOTAL NATIONAL FEE =</b>	\$ 591.00																									
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +	\$																									
<b>TOTAL FEES ENCLOSED =</b>	\$ 591.00																									
	Amount to be refunded: \$																									
	charged: \$																									

a. ☒ A check in the amount of \$ 591.00 to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_ to cover the above fees.  
 A duplicate copy of this sheet is enclosed.

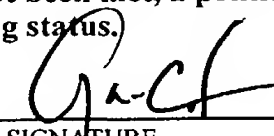
c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any  
 overpayment to Deposit Account No. 03-2405. A duplicate copy of this sheet is enclosed.

d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card  
 information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

**NOTE:** Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR  
 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO COHEN, Gary M., Esq. Strafford Building Number Three 125 Strafford Avenue, Suite 300 Wayne, PA 19087-3318 United States of America Telephone: (610) 975-4430 Facsimile: (610) 975-4436	 SIGNATURE COHEN, Gary M., Esq. NAME <u>28,834</u> REGISTRATION NUMBER
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(12) DEMANDE INTERNATIONALE PUBLIÉE EN VERTU DU TRAITE DE COOPÉRATION  
EN MATIÈRE DE BREVETS (PCT)

(19) Organisation Mondiale de la Propriété  
Intellectuelle  
Bureau international



(43) Date de la publication internationale  
22 mars 2001 (22.03.2001)

PCT

(10) Numéro de publication internationale  
WO 01/20749 A1

(51) Classification internationale des brevets<sup>7</sup>: H02J 13/00

(74) Mandataire: VIDON, Patrice; Le Nobel, 2, allée Antoine  
Becquerel, F-35703 Rennes Cedex 7 (FR).

(21) Numéro de la demande internationale:

PCT/FR00/02492

(81) États désignés (*national*): AE, AG, AL, AM, AT, AU, AZ,  
BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE,  
DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU,  
ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS,  
LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO,  
NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR,  
TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(22) Date de dépôt international:

8 septembre 2000 (08.09.2000)

(25) Langue de dépôt:

français

(26) Langue de publication:

français

(30) Données relatives à la priorité:

99/11706 15 septembre 1999 (15.09.1999) FR

(71) Déposant et

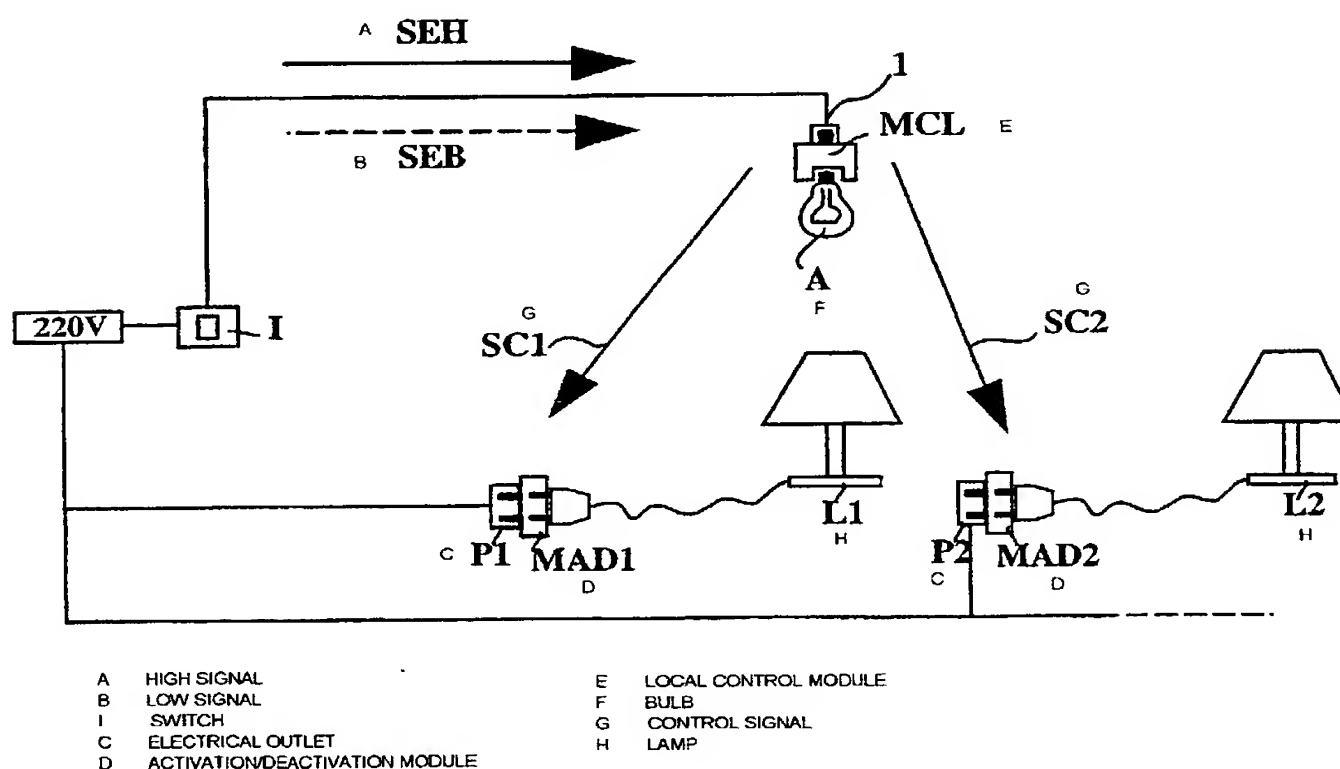
(72) Inventeur: PRIGENT, Erven [FR/FR]; Kerdren, F-22290  
Treverec (FR).

(84) États désignés (*régional*): brevet ARIPO (GH, GM, KE,  
LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), brevet eurasien  
(AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), brevet européen  
(AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU,  
MC, NL, PT, SE), brevet OAPI (BF, BJ, CF, CG, CI, CM,  
GA, GN, GW, ML, MR, NE, SN, TD, TG).

[Suite sur la page suivante]

(54) Title: REMOTE CONTROL SYSTEM FOR AT LEAST AN ELECTRICAL APPARATUS, AND MODULES COMPONENT  
MODULES OF SAID SYSTEM

(54) Titre: SYSTEME DE COMMANDE A DISTANCE D'AU MOINS UN APPAREIL ELECTRIQUE, ET MODULES CONSTI-  
TUTIFS DE CE SYSTEME



(57) Abstract: The invention concerns a remote control system for at least an electrical apparatus (L1, L2) comprising: activating/de-activating means, designed to be installed in series between an electric power source (P1, P2) and at least an electrical apparatus (L1, L2) to be activated/deactivated, and remote control means for said activating/deactivating means. The invention is characterised in that the remote control means include: means for detecting changes of state in an electrical connection element (1) controlled by a switch (I); means for monitoring said activating/deactivating means, on the basis of detected changes.

[Suite sur la page suivante]

WO 01/20749 A1

EXPRESS MAIL NO.: ET069433584US

PATENT  
prigent1.d01

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of :  
PRIGENT, Erven :  
International Application :  
No. PCT/FR00/02492 :  
International Filing :  
Date: 8 September 2000 :  
For a Patent for a :  
REMOTE CONTROL SYSTEM FOR AT LEAST :  
AN ELECTRICAL APPARATUS, AND MODULES :  
COMPONENT MODULES OF SAID SYSTEM : 15 March 2002

PRELIMINARY AMENDMENT

Box PCT  
Commissioner for Patents  
Washington, D.C. 20231

Sir:

This Preliminary Amendment accompanies a Transmittal Letter entering the above-identified PCT application into its national phase for the United States. Prior to examination, please amend the claims as follows.

IN THE CLAIMS

Please cancel claim 17 and amend the following claims:

1. (Amended) A remote control system for at least one electric device (L1 to L11) comprising:

- activation/deactivation means (5; 11; 13) intended to be placed in series between an electric power source (P1, P2) and at least one electric device (L1 to L11) to be activated/deactivated;
- remote control means for said activation/deactivation means;

characterized in that said remote control means comprise:

- means (2; 7 to 9) for detecting state changes in an electric connection element (1) controlled by a switch (I);
- means (3; 10) for operating said activation/deactivation means as a function of the detected state changes, presenting at least the two following operating modes:
  - a base mode activated by a single tap on said switch;
  - at least one advanced mode, with each advanced mode being activated by a predetermined multiple number of taps on said switch, corresponding to a distinct number greater than one of closely spaced together taps and causing the transmission by said transmission means comprised in said operating means of a particular control signal, referred to as a transition signal (SC3, SC6, SC9) and specific to said advanced mode.

3. (Amended) System according to claim 1, characterized in that said electric power source belongs to the group comprising:

- lighting sockets whose associated switch is maintained in the "on" position;
- outlet plugs (P1, P2).

4. (Amended) System according to claim 1, characterized in that all of the constitutive means (2, 3) of said remote control means are comprised in a single local

control module (MCL) intended to be installed on said electric connection element (1) controlled by a switch (I).

6. (Amended) System according to claim 4, characterized in that it comprises a multiplicity of activation/deactivation modules (MAD1, MAD2) each enabling activation/deactivation of at least one distinct electric device (L1, L2).

7. (Amended) System according to claim 1, characterized in that said means for detection of state changes of said electric connection means themselves comprise:

- in a retransmission module (MR) intended to be installed on said electric connection element (1) : means for transmission (7) of state signals (SEH', SEB') as a function of the successive electric states of said electric connection element controlled by a switch;
- in a remote control module (MCD) : means (8) for receiving said state signals and means (9) for detection of changes in state of said electric connection element from said received state signals (SEH', SEB');

and in that said remote control module (MCD) furthermore comprises said means (10) for operating said activation/deactivation means (13).

10. (Amended) System according to claim 8, characterized in that said remote control module (MCD) moreover comprises other activation/deactivation means (11) operated directly by said operating means (10) so as to activate/deactivate at least one other electric device (L1), with said remote control module (MCD) being placed in series between an electric power source (P1) and said at least one other electric device (L1).

13. (Amended) System according to claim 5, characterized in that said at least one control signal (SC; SC1 to SC11) belongs to the group comprising:

- radio control signals;
- ultra high frequency signals superimposed on the normal voltage on the electric network according to the carrier current technique.

14. (Amended) System according to claim 7, characterized in that said state signals (SEH', SEB') belong to the group comprising:

- radio control signals;
- ultra high frequency signals superimposed on the normal voltage on the electric network according to the carrier current technique.

15. (Amended) System according to claim 7, characterized in that said means for transmitting state signals transmit at least the two following state signals:

- a low state signal (SEB');
- a high state signal (SEH').

16. (Amended) System according to claim 1, characterized in that it furthermore comprises means for assessing the state of at least a part of the system.

18. (Amended) System according to claim 1, characterized in that the system returns from said at least one advanced mode to said base mode upon performance of a return procedure, with said procedure belonging to the group comprising:

- automatic return after a predetermined duration of time in said or one of said advanced mode(s);
- manual return after a particular multiple tapping, referred to as locking.

19. (Amended) System according to claim 8, characterized in that in each operating mode said transmission means comprised in said operating means furthermore transmit at least the following two control signals specific to said operating mode:

- a connection signal (SC1, SC4, SC7, SC10);
- a disconnection signal (SC2, SC5, SC8, SC11).

21. (Amended) System according to claim 19, characterized in that in at least one given operating mode said connection signal and said disconnection signal are identical such that the at least one electric device is activated after each transmission of said connection signal and deactivated after each transmission of said disconnection signal.

22. (Amended) System according to claim 19, characterized in that said electric connection element (1) controlled by said switch (I) is deactivated upon passage into said at least one advanced mode.

23. (Amended) System according to claim 19, characterized in that at least one distinct electric device (L3, L6, L9) is activated after the first transmission of a transition signal and deactivated after the second transmission of said transition signal.

25. (Amended) System according to claim 1, characterized in that the activation/deactivation of a device can also consist of a continuous or discontinuous regulation of at least one operating parameter of said device.

26. (Amended) A local control module (MCL) of the type comprised in a remote control system according to claim 1.



27. (Amended) A remote control module (MCD; MCD1, MCD2, MCD3) of the type comprised in a remote control system according to claim 1.

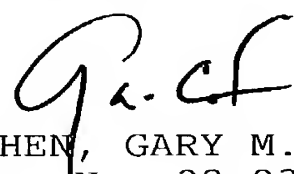
28. (Amended) An activation/deactivation module (MAD1, MAD2) of the type comprised in a remote control system according to claim 1.

29. (Amended) A retransmission module (MR) of the type comprised in a remote control system according to claim 1.

REMARKS

Prior to examination, entry of the foregoing rewritten claims to amend independent claim 1 to include the subject matter of former claim 17 (now canceled) and to delete multiple dependencies to bring the claims into closer compliance with 37 C.F.R. §1.75(c), is respectfully requested in accordance with the provisions of 37 C.F.R. §1.115. Marked up versions of the rewritten claims are enclosed with this Preliminary Amendment, on separate pages, in accordance with the requirements of 37 C.F.R. §1.121(c). An early and favorable consideration of the present application, as amended, is respectfully requested.

Respectfully submitted,

  
COHEN, GARY M., ESQ.  
Reg. No. 28,834  
Attorney for Applicant

MARKED UP VERSIONS OF THE REWRITTEN CLAIMS

1. (Amended) A remote [Remote] control system for at least one electric device (L1 to L11) comprising:

- activation/deactivation means (5; 11; 13) intended to be placed in series between an electric power source (P1, P2) and at least one electric device (L1 to L11) to be activated/deactivated;
- remote control means for said activation/deactivation means;

characterized in that said remote control means comprise:

- means (2; 7 to 9) for detecting state changes in an electric connection element (1) controlled by a switch (I);
- means (3; 10) for operating said activation/deactivation means as a function of the detected state changes, presenting at least the two following operating modes:
  - = a base mode activated by a single tap on said switch;
  - = at least one advanced mode, with each advanced mode being activated by a predetermined multiple number of taps on said switch, corresponding to a distinct number greater than one of closely spaced together taps and causing the transmission by said transmission means comprised in said operating means of a particular control signal, referred to as a transition signal (SC3, SC6, SC9) and specific to said advanced mode.

3. (Amended) System according to claim [either one of claims] 1 [or 2], characterized in that said electric power source belongs to the group comprising:

- lighting sockets whose associated switch is maintained in the "on" position;
- outlet plugs (P1, P2).

4. (Amended) System according to claim [any one of claims] 1 [to 3], characterized in that all of the constitutive means (2, 3) of said remote control means are comprised in a single local control module (MCL) intended to be installed on said electric connection element (1) controlled by a switch (I).

6. (Amended) System according to claim [either one of claims] 4 [or 5], characterized in that it comprises a multiplicity of activation/deactivation modules (MAD1, MAD2) each enabling activation/deactivation of at least one distinct electric device (L1, L2).

7. (Amended) System according to claim [any one of claims] 1 [to 3], characterized in that said means for detection of state changes of said electric connection means themselves comprise:

- in a retransmission module (MR) intended to be installed on said electric connection element (1) : means for transmission (7) of state signals (SEH', SEB') as a function of the successive electric states of said electric connection element controlled by a switch;
- in a remote control module (MCD) : means (8) for receiving said state signals and means (9) for detection of changes in state of said electric connection element from said received state signals (SEH', SEB');

and in that said remote control module (MCD) furthermore comprises said means (10) for operating said activation/deactivation means (13).

10. (Amended) System according to claim [either one of claims] 8 [or 9], characterized in that said remote control module (MCD) moreover comprises other activation/deactivation means (11) operated directly by said operating means (10) so

as to activate/deactivate at least one other electric device (L1), with said remote control module (MCD) being placed in series between an electric power source (P1) and said at least one other electric device (L1).

13. (Amended) System according to claim [any one of claims] 5 [to 12], characterized in that said at least one control signal (SC; SC1 to SC11) belongs to the group comprising:

- radio control signals;
- ultra high frequency signals superimposed on the normal voltage on the electric network according to the carrier current technique.

14. (Amended) System according to claim [any one of claims] 7 [to 13], characterized in that said state signals (SEH', SEB') belong to the group comprising:

- radio control signals;
- ultra high frequency signals superimposed on the normal voltage on the electric network according to the carrier current technique.

15. (Amended) System according to claim [any one of claims] 7 [to 14], characterized in that said means for transmitting state signals transmit at least the two following state signals:

- a low state signal (SEB');
- a high state signal (SEH').

16. (Amended) System according to claim [any one of claims] 1 [to 15], characterized in that it furthermore comprises means for assessing the state of at least a part of the system.

18. (Amended) System according to claim 1 [17], characterized in that the system returns from said at least

one advanced mode to said base mode upon performance of a return procedure, with said procedure belonging to the group comprising:

- automatic return after a predetermined duration of time in said or one of said advanced mode(s);
- manual return after a particular multiple tapping, referred to as locking.

19. (Amended) System according to claim [17 or 18 and any one of claims] 8 [to 16], characterized in that in each operating mode said transmission means comprised in said operating means furthermore transmit at least the following two control signals specific to said operating mode:

- a connection signal (SC1, SC4, SC7, SC10);
- a disconnection signal (SC2, SC5, SC8, SC11).

21. (Amended) System according to claim [either one of claims] 19 [or 20], characterized in that in at least one given operating mode said connection signal and said disconnection signal are identical such that the at least one electric device is activated after each transmission of said connection signal and deactivated after each transmission of said disconnection signal.

22. (Amended) System according to claim [any one of claims] 19 [to 21], characterized in that said electric connection element (1) controlled by said switch (I) is deactivated upon passage into said at least one advanced mode.

23. (Amended) System according to claim [any one of claims] 19 [to 22], characterized in that at least one distinct electric device (L3, L6, L9) is activated after the first transmission of a transition signal and deactivated after the second transmission of said transition signal.

25. (Amended) System according to claim [any one of claims] 1 [to 24], characterized in that the activation/deactivation of a device can also consist of a continuous or discontinuous regulation of at least one operating parameter of said device.

26. (Amended) A local [Local] control module (MCL) of the type comprised in a remote control system according to claim 1 [any one of claims 4 to 6 and 13 to 25].

27. (Amended) A remote [Remote] control module (MCD; MCD1, MCD2, MCD3) of the type comprised in a remote control system according to claim 1 [any one of claims 7 to 25].

28. (Amended) An activation/deactivation [Activation/deactivation] module (MAD1, MAD2) of the type comprised in a remote control system according to claim 1 [any one of claims 5 to 25].

29. (Amended) A retransmission [Retransmission] module (MR) of the type comprised in a remote control system according to claim 1 [any one of claims 7 to 25].

10/pts  
1

REMOTE CONTROL SYSTEM FOR AT LEAST AN ELECTRICAL  
APPARATUS, AND MODULES COMPONENT MODULES OF SAID SYSTEM

The invention concerns the field of home automation.

More specifically, the invention concerns remote control  
5 systems for electric devices (lamps, televisions, computers,  
etc.).

The potential consumer has available at present a large  
range of remote control systems of all types. The most  
sophisticated remote control systems remain expensive and  
10 difficult for a neophyte to install while the other systems  
are simple but completely ineffective.

These remote control systems traditionally comprise one  
or more activation/deactivation radio control devices and a  
multifunction radio control housing. Each radio control  
15 device is intended to be placed in series between an electric  
power source (generally, an electric plug or a lighting socket  
whose associated switch is kept in the "on" position) and an  
electric device to be activated/deactivated. The radio  
control housing makes it possible for the user who is holding  
20 it to act remotely on various activation/deactivation devices  
so as to selectively activate/deactivate various electric  
devices.

The major drawback of these known systems is the  
requirement that the user must have the radio control housing  
25 in his possession at all times. In fact, it frequently occurs  
that the housing is misplaced or is difficult to reach because  
another user has used it and put it down somewhere. Thus, it  
is not unusual for the user to enter a dark room and have to  
first of all search for the remote control housing which will  
30 allow him to activate the various lighting means in that room!

Another drawback stems from the frequent presence of a  
large number of activation/deactivation radio control devices.  
In this case, the alternatives are either a single  
multifunction radio control housing, which tends to be bulky,

complex and thus difficult to use, or it is possible to use multiple radio control housings but this variety of housings seems to be poorly acceptable by the user from a practical point of view.

5       The objective of the invention is to resolve these various drawbacks of the state of the art.

More specifically, one of the objectives of the present invention is to provide a remote control system for electric devices which does not require a radio control housing.

10       The invention also has as its objective to provide a system of this type which is very effective, flexible and inexpensive.

Another objective of the invention is to provide a system of this type which can be easily installed and removed.

15       A complementary objective of the invention is to provide a system of this type which remains compatible with the traditional home automation modules (activation/deactivation radio control devices) and thereby offer the possibility of using in addition a conventional remote control for remotely  
20       modifying the status of various electric devices without having to change location.

Still another objective of the invention is to provide a system of this type which does not affect the normal operations of the electric installation especially with regard  
25       to lighting control.

These various objectives as well as other objectives which will appear below are attained according to the invention by means of a system for the remote control of at least one electric device of the type comprising:

- 30       -     activation/deactivation means intended to be placed in series between an electric power source and at least one electric device to be activated/deactivated;
- means for remote control of said  
35       activation/deactivation means.

According to the present invention, said remote control



means comprise:

- means for detection of changes in state of an electric connection element controlled by a switch;
- means for operating said activation/deactivation means as a function of the detected changes in state.

The general principle of the invention thus comprises operating activation/deactivation means by a switch, with this switch controlling in a conventional manner an electric connection element. Simple applications of pressure by the user on the switch cause changes in state of the electric connection element. The operating of the activation/deactivation means (for one or more devices) is a function of these changes in state.

Thus, the system of the invention makes possible remote control of a multiplicity of electric devices by means of a simple switch (and not a radio control housing). With the switch being located generally close to the door, it is in particular possible when entering a dark room to easily activate various lighting means as well as to turn on a television, a stereo system, etc.

Said electric connection element controlled by a switch advantageously belongs to the group comprising lighting sockets and electric plugs. It is therefore not necessary to modify the existing electric infrastructure. In particular, it is not necessary to install special switches.

In an advantageous manner, said electric power source belongs to the group comprising lighting sockets whose associated switch is maintained in the "on" position and electric plugs.

In a first advantageous mode of implementation of the invention, all of the constitutive means of said remote control means are comprised in a single local control module intended to be installed on said electric connection element controlled by a switch.

Said operating means advantageously comprise means for

transmitting at least one control signal and said activation/deactivation means are comprised in an activation/deactivation module which is remote from said local control module and comprises means for receiving said at least  
5 one control signal.

Said system preferentially comprises a multiplicity of activation/deactivation modules such that each module can activate/deactivate at least one distinct electric device.

In a second advantageous mode of implementation of the  
10 invention, said means for detection of changes in state of said electric connection element themselves comprise:

- in a retransmission module intended to be installed on said electric connection means : means for transmission of state signals as a function of the  
15 successive electric states of said electric connection element controlled by a switch;
- in a remote control module : means for receiving said state signals and means for detection of changes in state of said electric connection element  
20 from said received state signals;

and said remote control module furthermore comprises means for operating said activation/deactivation means.

In this case, all of the remote control means are distributed between the retransmission module and the remote  
25 control module (whereas in the first mode of implementation, they are all grouped together within a single local control module).

In a first preferred example of the second mode of implementation of the invention, said operating means  
30 comprising means for transmission of at least one control signal and said activation/deactivation means are comprised in an activation/deactivation module which is remote from said remote control module and which comprises means for receiving said at least one control signal. Said system can furthermore  
35 comprise a multiplicity of activation/deactivation modules each of which can activate/deactivate at least one distinct

electric device. In other words, a single remote control module operates one or more activation/deactivation modules.

Said remote control module advantageously comprises moreover other activation/deactivation means operated directly  
5 by said operating means so as to activate/deactivate at least one other electric device, with said control module being placed in series between an electric power source and said at least one other electric device.

In a second preferred example of the second mode of  
10 implementation of the invention, said activation/deactivation means are comprised in said remote control module, with said operating means controlling directly said activation/deactivation means. Said system can moreover  
comprise a multiplicity of remote control modules each of  
15 which can activate/deactivate at least one distinct electric device.

In other words, one or more remote control modules each provides directly for the activation/deactivation of at least one electric device. There is no activation/deactivation  
20 module.

Said at least one control signal belongs preferentially to the group comprising radio control signals and ultra high frequency control signals superimposed on the normal voltage on the electric network according to the carrier current  
25 technique. Said state signals belong to the group comprising radio state signals and ultra high frequency signals superimposed on the normal voltage on the electric network according to the carrier current techniques. Said state signal transmission means transmit at least the two following  
30 state signals : a low state signal and a high state signal. It is obvious, however, that these lists are by no means exhaustive.

Said system furthermore comprises advantageously means for assessing the state of at least a part of the system.

35 In a preferential manner, said system presents at least the two following operating modes:

- a base mode activated by tapping once on said switch;
- at least one advanced mode, with each advanced mode being activated by tapping a predetermined multiple times on said switch, corresponding to a number of distinct closely spaced together switch taps greater than one and causing transmission by said transmission means comprised in said operating means of a particular control signal referred to as a transition signal and specific to said advanced mode.

10        Thus, in the absence of multiple switch taps (to restate, a multiple switch tap consists of a succession of closely spaced together switch taps) the switch controls normally the lighting up of the room, whether or not an advanced mode is locked in.

15        The system passes advantageously from said at least one advanced mode to said base mode when a return process is performed, with said return process belonging to the group comprising:

- automatic return after a predetermined duration of time in said or one of said advanced modes;
- manual return after a particular multiple switch tapping, referred to as locking.

25        It is possible to optionally provide means (for example, commutators) enabling the user to select one of these two procedures for returning to base mode. The term multiple-tap locking is used because the return to the base mode locks without time limit the advanced mode(s), each in a particular configuration.

30        In each operating mode preferably said transmission means comprised in each operating means transmit in addition at least the two following control signals, pertaining to said operating mode : a connection signal; a disconnection signal.

35        In a preferred manner, in at least one given operating mode, at least a first electric device is activated after the first transmission of said connection signal and deactivated after the second transmission of said connection signal, and

in said at least one given operating mode, at least a second electric device is activated after the first transmission of said disconnection signal and deactivated after the second transmission of said disconnection signal.

5        Advantageously, in at least one given operating mode said connection signal and said disconnection signal are identical, in a manner such that at least one electric device is activated after each transmission of said connection signal and deactivated after each transmission of said disconnection  
10    signal.

      In an advantageous manner, said electric connection element controlled by said switch is deactivated upon passage into said at least one advanced mode.

      In a preferred manner, at least one distinct electric  
15    device is activated after the first transmission of a transition signal and deactivated after the second transmission of said transition signal.

      All of the electric devices are preferentially deactivated simultaneously after transmission of a particular  
20    tapping signal, called the initialization signal.

      It is optionally possible to provide means (for example, commutators) enabling the user to select the number of taps of the initialization signal.

      According to an advantageous variant of implementation,  
25    the activation/deactivation of a device can also include a continuous or discontinuous regulation of at least one operating parameter of said device. Thus, for example, after transmission of the connection signal and transmission of the disconnection signal, it is possible to continuously activate  
30    a regulation signal. The applications of this variant are numerous, such as, for example, the control of the variation of the luminous intensity of a lamp or the operating of electric roller blinds.

      The invention also pertains to each of the modules  
35    comprised in the previously mentioned remote control system, i.e., the local control module (first mode of implementation)

or remote control module (second mode of implementation), the activation/deactivation module and the retransmission module.

Other characteristics and advantages of the invention will become apparent upon reading the description below of a preferred mode of implementation of the invention, presented  
5 as an indicative, nonlimitative example, and the attached drawings in which:

- 10 - figure 1 shows a simplified diagram of a first mode of implementation of a control system according to the present invention;
- figure 2 shows a simplified diagram of a specific mode of implementation of the local control module and one of the activation/deactivation modules shown in figure 1;
- 15 - figure 3 shows a simplified diagram of a second mode of implementation of a control system according to the present invention;
- figure 4 shows a simplified diagram of a specific mode of implementation of the retransmission module,  
20 the remote control module and one of the activation/deactivation modules shown in figure 3;
- figure 5 shows a simplified diagram of a third mode of implementation of a control system according to the present invention;
- 25 - figure 6 shows a simplified diagram of a specific mode of implementation of the retransmission module and one of the remote control modules shown in figure 5;
- figure 7 shows a simplified diagram of a mode of  
30 implementation of the local control module shown in figures 1 and 2;
- figure 8 shows a multiplicity of time-based diagrams explaining an example of management of the pulses within the local control module of figure 7; and
- 35 - figure 9 shows an application example of the first mode of implementation of the system according to

the invention as presented in figure 1.

We will now present a first mode of implementation of a control system according to the present invention with reference to figures 1, 2, 7, 8 and 9.

5 In this first mode of implementation, the remote control system comprises a local control module MCL and a multiplicity of activation/deactivation modules MAD1, MAD2,...

Each activation/deactivation module MAD1, MAD2,... is placed in series between an outlet plug P1, P2,... and a lamp  
10 L1, L2,... to be activated/deactivated. More generally speaking, it can be placed in series between any electric power source (for example, in addition to an electric socket, a lighting socket whose associated switch is maintained in the "on" position) and one (or more, in series) electric device(s)  
15 of any type (for example, a radio, a television, a stereo system, a microcomputer, a printer, etc.).

The local control module MCL is installed on a lighting socket 1 controlled by a switch I. It receives the bulb A originally intended to be installed on the socket 1. The  
20 module can also be installed on an outlet plug or more generally on any electric connection element controlled by a switch I.

In the specific mode of implementation shown in figure 2, the local control module MCL comprises:

- 25 - means 2 for detection of electric state changes. In operation, as a function of the user tapping on the switch, the lighting socket receives either a high state signal SEH (220 V) or a low state signal SEB (0 V);
- 30 - means 3 for operating, as a function of the detected state changes, activation/deactivation means 5 comprised in each activation/deactivation module. These operating means 3 themselves comprise means 31 for transmitting control signals SC.

35 In the example illustrated, this transmission uses the classic radio technique : the transmitted control signals SC

are radio signals. It is obvious that other types of transmission can be envisaged without departing from the scope of the present invention. For example, the transmission can use the carrier current technique : the transmitted control  
5 signals are then ultra high frequency signals superimposed on the normal voltage on the electric network.

Moreover, each activation/deactivation module (as shown for MAD1 in figure 2) comprises, in addition to activation/deactivation means 5, means 4 for receiving control  
10 signals SC.

In the application example shown in figure 9, the system according to the invention presents a base mode and three advanced modes, with each having an associated transition. Strictly for the sake of simplification, it is assumed here  
15 that each activation/deactivation module controls a single electric device, i.e., a lamp.

The base mode is automatically triggered as soon as the user taps once on the switch I (i.e., without specific manipulation). It enables normal control of the bulb A.  
20 Moreover, it enables control of two lamps L1, L2, by the transmission by the transmission means 31 comprised in the operating means 3 (which themselves are comprised in the local control module MCL) of the two following control signals : a connection signal SC1, transmitted at each detection of  
25 passage from the low state signal SEB (0 V) to the high state signal SEH (220 V), and a disconnection signal SC2 transmitted at each detection of a passage from the high state signal SEH to the low state signal SEB. In summary, the operation of the base mode is as follows:

- 30 - after a first tap on the switch (first transmission of the connection signal SC1), the bulb A and the first lamp L1 are turned on;
- after a second tap on the switch (first transmission of the disconnection signal SC2), the bulb A is  
35 turned off and the second lamp L2 is turned on;
- after a third tap on the switch (second transmission



of the connection signal SC1), the bulb A is turned on and the first lamp L1 is turned off;

- after a fourth tap on the switch (second transmission of the disconnection signal SC2), the bulb A and the second lamp L2 are turned off.

It should be noted that the connection signal SC1 and the disconnection signal SC2 can be identical. In this case, the bulb A and the first and second lamps L1, L2 are all turned on after one tap on the switch and then turned off upon the subsequent tap.

The first advanced mode is triggered when the user executes a double tapping (two taps spaced close together) on the switch I. This first transition, between the base mode and the first advanced mode, moreover enables controlling a third lamp L3 by means of the transmission by the previously mentioned transmission means 31 of the following control signal : a transition signal SC3, transmitted upon each detection of a double tapping (rapid succession of the following state signals : low/high/low). In summary, the operation of the first transition is as follows:

- after a first double tapping on the switch (first transmission of the transition signal SC3), the first advanced mode is activated and the third lamp L3 is turned on;
- after a second double tapping on the switch (second transmission of the transition signal SC3), the third lamp L3 is turned off.

So as to avoid "flickering" of the bulb A, the lighting socket is automatically deactivated upon passage to the first advanced mode. Thus, it is controlled only in the base mode.

Furthermore, when the system returns from an advanced mode to the base mode, the lamps controlled in this advanced mode are locked in their operating state (turned on or turned off). It can be provided that the system automatically returns to base mode after a predetermined duration of time in this advanced mode. It is also possible to provide a manual

return after a particular multiple tapping, referred to as locking. The two variants of the procedure for returning to base mode can be proposed simultaneously or alternatively.

Optionally, a particular multiple tapping, referred to as  
5 initialization, can enable turning off all of the lamps L1 to L11 simultaneously. If there is no third advanced mode, the initialization multiple tapping is, for example, a quadruple tapping, which replaces the third transition signal which is no longer required. In this case, upon each detection of a  
10 quadruple tapping, the previously mentioned transmission means 31 transmit an initialization signal (not shown in figure 9).

After it has been activated, the first advanced mode enables controlling two lamps L4, L5 by means of the transmission by the previously mentioned transmission means 31  
15 of the following two control signals : a connection signal SC4, transmitted upon each detection of a passage from the low state signal SEB to the high state signal SEH, and a disconnection signal SC5, transmitted upon each detection of a passage from the high state signal SEH to the low state  
20 signal SEB. In summary, the operation of the first advanced mode is the following:

- after a first tap on the switch (first transmission of the connection signal SC4), the fourth lamp L4 is turned on;
- 25 - after a second tap on the switch (first transmission of the disconnection signal SC5), the fifth lamp L5 is turned on;
- after a third tap on the switch (second transmission of the connection signal SC4), the fourth lamp L4 is  
30 turned off;
- after a fourth tap on the switch (second transmission of the disconnection signal SC5), the fifth lamp is turned off.

It should be noted that the connection signal SC4 and the  
35 disconnection signal SC5 can be identical. In this case, the fourth and fifth lamps L4, L5 are both turned on upon two taps

on the switch and then are both turned off upon the subsequent tap.

5 The second advanced mode is triggered when the user executes a triple tapping (three closely spaced apart taps) on the switch I. This second transition between the base mode and the second advanced mode moreover enables controlling a sixth lamp L6. After it has been activated, the second advanced mode enables controlling of two lamps L7, L8.

10 The third advanced mode is triggered when the user executes a quadruple tapping (four closely spaced apart taps) on the switch I. This third transition between the base mode and the third advanced mode moreover enables controlling a ninth lamp L9. After it has been activated, the third advanced mode enables controlling two lamps L10, L11.

15 The operation of these second and third transitions can be deduced directly from the operation of the first transition. Similarly, the operation of the second and third advanced modes can be deduced directly from the operation of the first advanced mode.

20 We shall now discuss in detail, with reference to the simplified diagram of figure 7, a specific mode of implementation of the local control module MCL. It comprises the means 2 for detection of electric state changes and the operating means 3. In addition to the control signal transmission means 31, the operating means 3 comprise : a  
25 calibrated pulse generator 32, a counter 33, a memory 34 and a multiplexer 35.

30 The state change detector 2 detects the changes in electric state (voltage) of the socket (passage from 0 V to 220 V, also referred to as "connection", or passage from 220 V to 0 V, also referred to as "disconnection") and transmits an uncalibrated connection or disconnection pulse, depending on the state change detected.

35 The calibrated pulse generator 32 provides for the calibration of the control (see definition below), transition, connection and disconnection pulses.

The counter 33 provides for the counting of the connection and disconnection pulses during a time period fixed by the control pulse.

5 The memory 34 provides for the storage in memory of the data provided by the counter 33. This part of the circuit allows storage in memory of the control stage (i.e., one of the advanced modes) for a programmable time period. After expiration of this time period, the memory is erased and the system returns to base mode.

10 The option "manual return to base mode" makes it possible to return manually to base mode at the level of a preselected stage.

The multiplexer 35 manages the pulses issued by sending them towards the outputs selected by means of the address  
15 inputs.

The relay 6 enables cutting off the power supply of the light bulb A (i.e., to deactivate the socket 1) during each passage into one of the advanced modes.

20 With reference to the multiple time diagrams of figure 8, we will now explain an example of management of the pulses within the local control module presented above and illustrated in figure 7. In figure 8, "C" and "D" stand for "connection" and "disconnection" respectively.

The first time diagram 81 shows the voltage on the socket  
25 1 (low or high state, 0 or 220 V) depending on whether or not it is connected to the sector power supply, as a function of the taps on the switch.

The second time diagram 82 shows the uncalibrated connection pulses. When the voltage on the socket passes from  
30 a low state to a high state, an uncalibrated connection pulse is generated.

The third time diagram 83 shows the uncalibrated disconnection pulses. When the voltage on the socket passes from a high state to a low state, an uncalibrated  
35 disconnection pulse is generated.

The fourth time diagram 84 shows the sum of the

uncalibrated connection and disconnection pulses.

The fifth time diagram 85 shows the control pulses. Each uncalibrated connection or disconnection pulse triggers a calibrated control pulse. This control pulse is not transmitted in advanced mode. The duration of this control pulse constitutes a time period that enables the incrementing of the counter but also prevents the transmission of untimely connection or disconnection pulses (i.e., untimely control signals) to the devices managed in base mode in the case of pulses generated close together. Each of these connection or disconnection pulses (or control signals) is transmitted only in calibrated form, i.e., after a delay equal to the duration of the associated control pulse.

The sixth time diagram 86 shows the calibrated connection pulses. Each uncalibrated connection pulse generates a calibrated connection pulse after stopping of the corresponding control pulse, leading to a delay in the execution of the command. This delay then disappears in advanced mode due to suppression of the control pulse.

The seventh time diagram 87 shows the calibrated disconnection pulses. The comments above regarding the calibrated connection pulses can readily be transposed to this seventh diagram.

The eighth time diagram 88 shows the calibrated transition pulses. They are transmitted during each transition towards a control stage (i.e., towards an advanced mode).

The ninth time diagram 89 shows the counter output. This output is only incremented in the presence of a control pulse. Each stopping of a control pulse automatically initializes the counter. In this manner, only the pulses which are very close together can increment the counter.

We will now present, with reference to figures 3 and 4, a second mode of implementation of a control system according to the present invention.

In this second mode of implementation, the remote control

system comprises a retransmission module MR, a remote control module MCD and a multiplicity of activation/deactivation modules MAD1, MAD2,...

As was the case with the first mode of implementation discussed above, each activation/deactivation module MAD1, MAD2,... is placed in series between an outlet plug P1, P2,... and a lamp L1, L2,... to be activated/deactivated. More generally speaking, it can be placed in series between any power supply whatsoever and any (or multiple, in series) electric device(s) whatsoever.

The retransmission module MR is installed on a lighting socket 1 controlled by a switch I. It retransmits to the remote control module MCD the high or low state signals received successively by the socket as a function of the user's taps on the switch I. Furthermore, it receives the bulb A intended originally to be installed on the socket 1. The module can also be installed on an outlet plug or more generally speaking on any electric connection element controlled by a switch I.

The remote control module MCD has the same role as the local control module MCL of the first mode of implementation, i.e., to operate the various activation/deactivation modules as a function of the changes in electric state of the socket 1 (i.e., as a function of the user's taps on the switch). The only difference is that it receives the retransmitted signals SEH', SEB' rather than receiving directly the state signals SEH, SEB arriving at the socket.

In the specific mode of implementation shown in figure 4, the retransmission module MR comprises means 7 for transmission of "retransmitted" state signals SEH', SEB' as a function of the successive electric states of the socket. In other words, the module MR receives the state signals SEH, SEB in the form of a voltage associated with each state (220 V for SEH and 0 V for SEB) and then retransmits them in another form. In the example illustrated, this retransmission uses the carrier current technique : the retransmitted state

signals are ultra high frequency signals superimposed on the normal voltage on the electric network. It is obvious that other types of relay transmission can be envisaged without departing from the scope of the present invention. For example, the retransmission can use the classic radio technique : the retransmission signals would then be radio signals.

The remote control module MCD comprises:

- means 8 for receiving the retransmitted state signals SEH', SEB';
- means 9 for detecting electric state changes from the retransmitted state signals SEH', SEB' received;
- means 10 for operating as a function of the detected state changes activation/deactivation means 13 comprised in each activation/deactivation module. These operating means 10 themselves comprise control signal transmission means 101.

In the example illustrated, this transmission uses the carrier current technique : the transmitted control signals SC1, SC2 are ultra high frequency signals superimposed on the normal voltage on the electric network. It is obvious that other types of transmission can be envisaged without departing from the scope of the present invention. For example, the transmission can use the classic radio technique : the transmission signals would then be radio signals.

Moreover, each activation/deactivation module (as shown by MAD1 in figure 4) comprises in addition to the activation/deactivation means 13, means 12 for receiving the control signals.

Optionally and as shown in figures 3 and 4, the remote control module MCD can comprise in addition other activation/deactivation means 11 (for example a relay 6) operated directly by the operating means 10, in a manner so as to activate/deactivate at least one other electric device. The control module is in this case placed in series between an electric power source (plug P1) and this other electric device

(lamp L1). For this option (cf. figure 7), one of the channels of the multiplexer 35 controls directly the relay 6 for activating or deactivating the lamp L1 (which replaces in this case the bulb A of the first mode of implementation).

5 We will now present, with reference to figures 5 and 6, a third mode of implementation of a control system according to the present invention. This mode of implementation differs from the second mode of implementation presented above solely in that a remote control module MCD1, MCD2, MCD3 is placed  
10 between each plug P1, P2, P3,... and each associated controlled lamp L1, L2, L3,... Thus, there is a multiplicity of remote control modules but not of activation/deactivation modules. In this configuration, within the operating means comprised in each remote module, only the multiplexer 35 channel (cf.  
15 figure 7) controlling the relay 6 is used.

Optionally, the system according to the present invention can also comprise audio and/or visual means for assessing the state of at least part of the system. This option is particularly useful when the system enables control, from a  
20 switch located in a first room, of devices located in other rooms. This makes it possible, for example, just after waking up to turn on the coffee maker in the kitchen by means of the bedside lamp.

For this purpose, the local control module MCL (cf.  
25 figure 1, first mode of implementation), the single remote control module MCD (cf. figure 3, second mode of implementation) or each of the remote control modules MCD1, MCD2,... (cf. figure 5, third mode of implementation) comprises means for transmission of a multiplicity of signals tracking  
30 the operation of the system, each signal containing at least one specific information component such as, for example:

- the operating status (on or off) of a given device;
- passage to a given operating mode (base mode, advanced modes);
- 35 - etc.

Moreover, the means for assessing the state of the



system, which are for example in the form of a visualization module MV that can be installed on a plug, comprise means for receiving operation tracking signals and means for transcribing (for example, in audio and/or visual form) the information contained in these signals.

It is obvious that numerous other modes of implementation can be envisaged without departing from the scope of the invention.

Thus, the activation/deactivation of a device can also consist of a continuous or discontinuous regulation of at least one operating parameter of this device. In the case of a continuous regulation, the transmission means 31 (cf. figures 2 and 7) transmit a continuous control signal rather than a pulsed control signal. For example, the continuous control signal is transmitted starting from each connection (passage from 0 to 220 V) and continuing up to the following disconnection (passage from 220 to 0 V). This variant of the invention is particularly useful for controlling electric roller blinds or varying the luminous intensity of a lamp.

Moreover, so as to adapt to the user's personal requirement, the user can implement certain choices by means of simple commutators. These choices can be implemented at three levels : for the entirety of the system, for a given control stage (i.e., a given operating mode) or for a given control signal SC1, SC2,... Among these choices, we can mention especially the choice between the automatic and manual procedures for returning to base mode, the choice between a pulsed or continuous control signal, or the choice between identical or different connection and disconnection signals.

## CLAIMS

1. Remote control system for at least one electric device (L1 to L11) comprising:

- 5       - activation/deactivation means (5; 11; 13) intended to be placed in series between an electric power source (P1, P2) and at least one electric device (L1 to L11) to be activated/deactivated;
- remote control means for said activation/deactivation means;

10   characterized in that said remote control means comprise:

- means (2; 7 to 9) for detecting state changes in an electric connection element (1) controlled by a switch (I);
- 15     - means (3; 10) for operating said activation/deactivation means as a function of the detected state changes.

2. System according to claim 1, characterized in that said electric connection element controlled by a switch belongs to the group comprising:

- 20       - lighting sockets (1);
- outlet plugs.

3. System according to either one of claims 1 or 2, characterized in that said electric power source belongs to the group comprising:

- 25       - lighting sockets whose associated switch is maintained in the "on" position;
- outlet plugs (P1, P2).

4. System according to any one of claims 1 to 3, characterized in that all of the constitutive means (2, 3) of  
30   said remote control means are comprised in a single local control module (MCL) intended to be installed on said electric connection element (1) controlled by a switch (I).

5. System according to claim 4, characterized in that said operating means (3) comprise means (31) for transmitting at  
35   least one control signal (SC) and in that said activation/deactivation means (5) are comprised in an

activation/deactivation module (MAD1, MAD2) which is remote from said local control module (MCL) and which comprises means (4) for receiving said at least one control signal.

6. System according to either one of claims 4 or 5, characterized in that it comprises a multiplicity of activation/deactivation modules (MAD1, MAD2) each enabling activation/deactivation of at least one distinct electric device (L1, L2).

7. System according to any one of claims 1 to 3, characterized in that said means for detection of state changes of said electric connection means themselves comprise:

- in a retransmission module (MR) intended to be installed on said electric connection element (1) : means for transmission (7) of state signals (SEH', SEB') as a function of the successive electric states of said electric connection element controlled by a switch;
- in a remote control module (MCD) : means (8) for receiving said state signals and means (9) for detection of changes in state of said electric connection element from said received state signals (SEH', SEB');

and in that said remote control module (MCD) furthermore comprises said means (10) for operating said activation/deactivation means (13).

8. System according to claim 7, characterized in that said operating means (10) comprise means (101) for transmission of at least one control signal (SC1, SC2) and in that said activation/deactivation means (13) are comprised in an activation/deactivation module (MAD1, MAD2) which is remote from said remote control module (MCD) and which comprises means (12) for receiving said at least one control signal.

9. System according to claim 8, characterized in that it comprises a multiplicity of activation/deactivation modules (MAD1, MAD2) each enabling the activation/deactivation of at least one distinct electric device (L2, L3).

10. System according to either one of claims 8 or 9, characterized in that said remote control module (MCD) moreover comprises other activation/deactivation means (11) operated directly by said operating means (10) so as to  
5 activate/deactivate at least one other electric device (L1), with said remote control module (MCD) being placed in series between an electric power source (P1) and said at least one other electric device (L1).

11. System according to claim 7, characterized in that said  
10 activation/deactivation means (11) are comprised in said remote control module (MCD), with said operating means (10) controlling directly said activation/deactivation means (11).

12. System according to claim 11, characterized in that it comprises a multiplicity of remote control modules (MCD1,  
15 MCD2, MCD3) each enabling the activation/deactivation of at least one distinct electric device (L1, L2, L3).

13. System according to any one of claims 5 to 12, characterized in that said at least one control signal (SC; SC1 to SC11) belongs to the group comprising:

- 20       - radio control signals;  
         - ultra high frequency signals superimposed on the normal voltage on the electric network according to the carrier current technique.

14. System according to any one of claims 7 to 13,  
25 characterized in that said state signals (SEH', SEB') belong to the group comprising:

- radio control signals;  
         - ultra high frequency signals superimposed on the normal voltage on the electric network according to  
30       the carrier current technique.

15. System according to any one of claims 7 to 14, characterized in that said means for transmitting state signals transmit at least the two following state signals:

- a low state signal (SEB');  
35       - a high state signal (SEH').

16. System according to any one of claims 1 to 15,

characterized in that it furthermore comprises means for assessing the state of at least a part of the system.

17. System according to any one of claims 1 to 15, characterized in that it presents at least the two following operating modes:

- a base mode activated by a single tap on said switch;
- at least one advanced mode, with each mode being activated by a predetermined multiple number of taps on said switch, corresponding to a distinct number greater than one of closely spaced together taps and causing the transmission by said transmission means comprised in said operating means of a particular control signal, referred to as a transition signal (SC3, SC6, SC9) and specific to said advanced mode.

18. System according to claim 17, characterized in that the system returns from said at least one advanced mode to said base mode upon performance of a return procedure, with said procedure belonging to the group comprising:

- automatic return after a predetermined duration of time in said or one of said advanced mode(s);
- manual return after a particular multiple tapping, referred to as locking.

19. System according to claim 17 or 18 and any one of claims 8 to 16, characterized in that in each operating mode said transmission means comprised in said operating means furthermore transmit at least the following two control signals specific to said operating mode:

- a connection signal (SC1, SC4, SC7, SC10);
- a disconnection signal (SC2, SC5, SC8, SC11).

20. System according to claim 19, characterized in that in at least one given operating mode at least a first electric device is activated after the first transmission of said connection signal and deactivated after the second transmission of said connection signal, and in that in said at least one given operating mode at least a second electric

device is activated after the first transmission of said disconnection signal and deactivated after the second transmission of said disconnection signal.

21. System according to either one of claims 19 or 20, characterized in that in at least one given operating mode said connection signal and said disconnection signal are identical such that the at least one electric device is activated after each transmission of said connection signal and deactivated after each transmission of said disconnection signal.

22. System according to any one of claims 19 to 21, characterized in that said electric connection element (1) controlled by said switch (I) is deactivated upon passage into said at least one advanced mode.

23. System according to any one of claims 19 to 22, characterized in that at least one distinct electric device (L3, L6, L9) is activated after the first transmission of a transition signal and deactivated after the second transmission of said transition signal.

24. System according to claim 23, characterized in that all of the electric devices are deactivated simultaneously after transmission of a particular multiple tapping signal, referred to as an initialization signal.

25. System according to any one of claims 1 to 24, characterized in that the activation/deactivation of a device can also consist of a continuous or discontinuous regulation of at least one operating parameter of said device.

26. Local control module (MCL) of the type comprised in a remote control system according to any one of claims 4 to 6 and 13 to 25.

27. Remote control module (MCD; MCD1, MCD2, MCD3) of the type comprised in a remote control system according to any one of claims 7 to 25.

28. Activation/deactivation module (MAD1, MAD2) of the type comprised in a remote control system according to any one of claims 5 to 25.

29. Retransmission module (MR) of the type comprised in a remote control system according to any one of claims 7 to 25.

ABSTRACT

The invention concerns a remote control system for at least an electrical apparatus (L1, L2) comprising: activating/de-activating means, designed to be installed in series between an electric power source (P1, P2) and at least an electrical apparatus (L1, L2) to be activated/deactivated, and remote control means for said activating/deactivating means. The invention is characterized in that the remote control means include: means for detecting changes of state in an electrical connection element (1) controlled by a switch (I); means for monitoring said activating/deactivating means, on the basis of detected changes.





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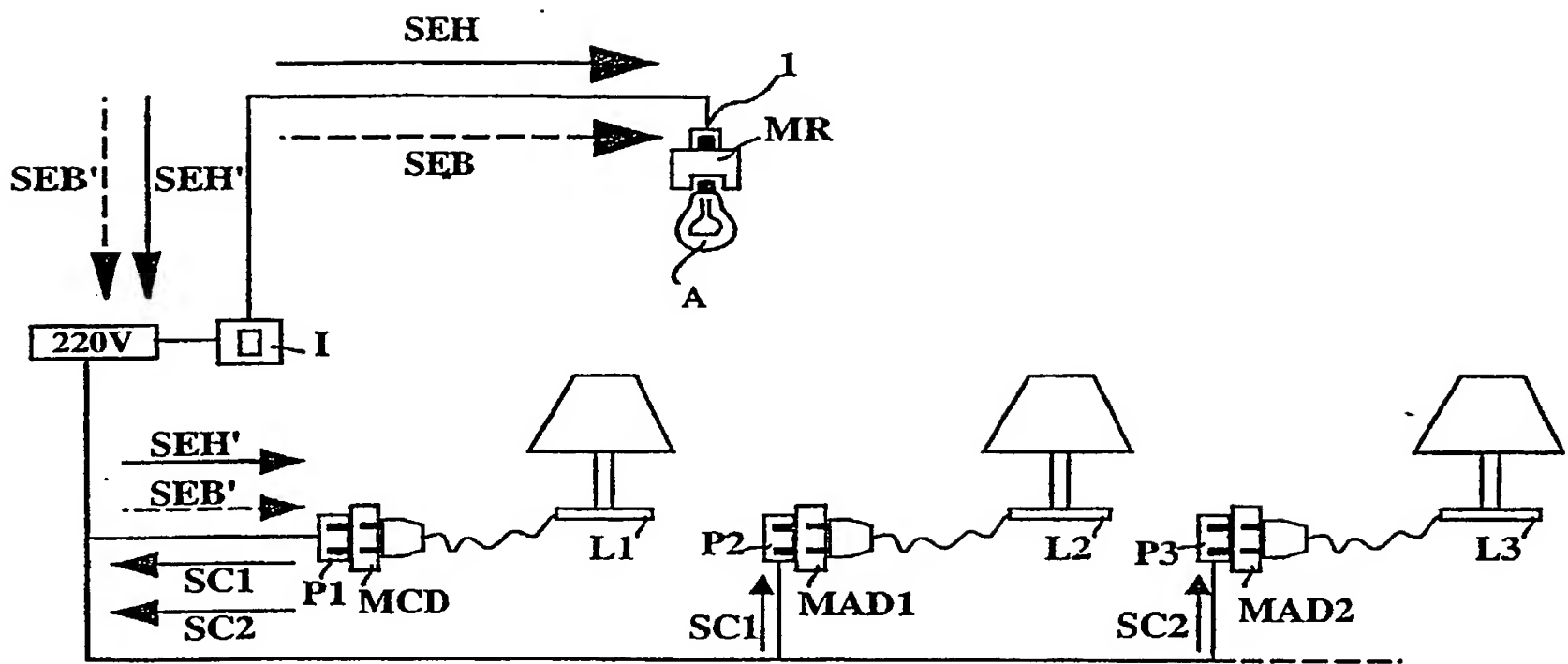


Fig 3

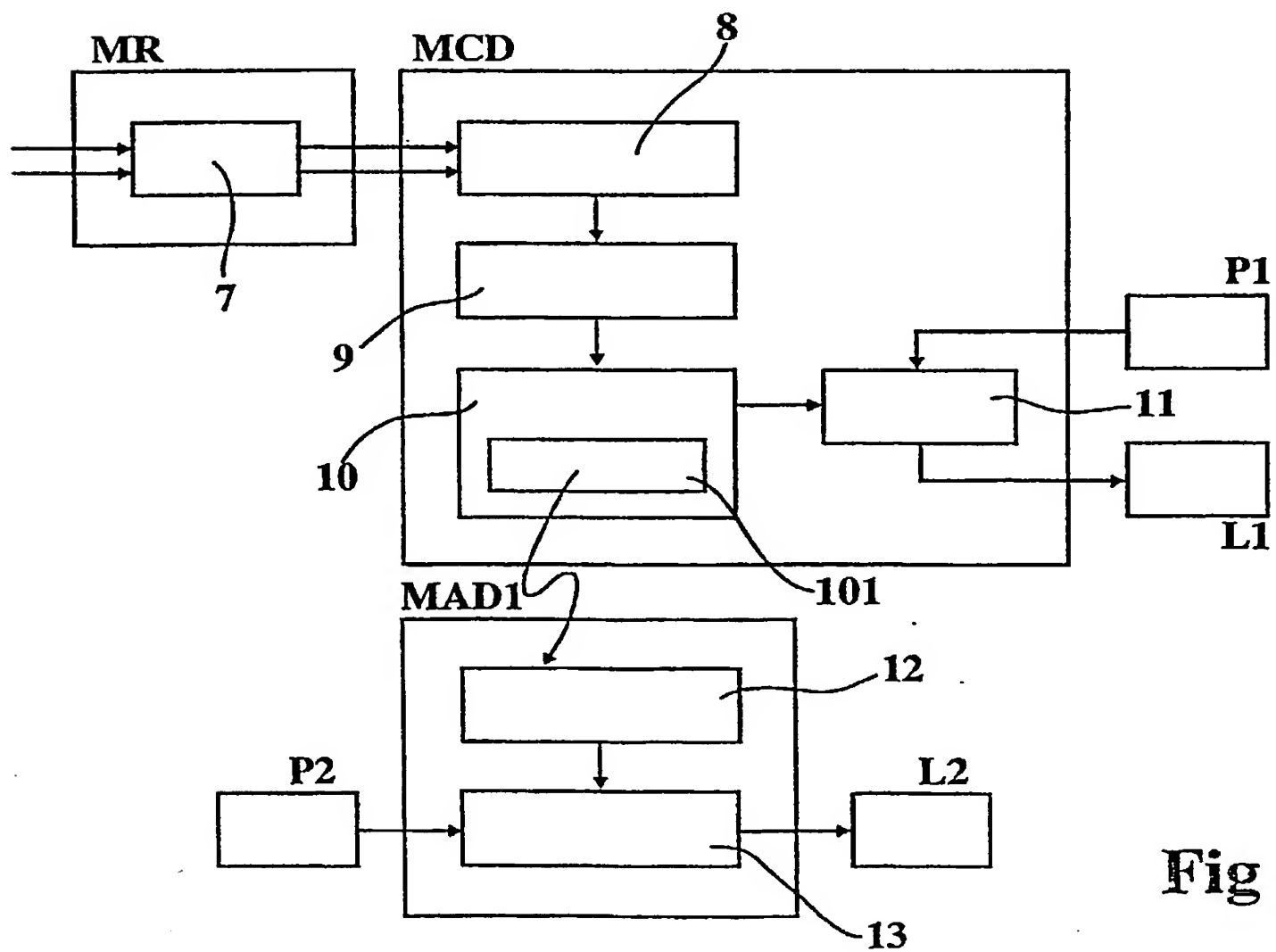


Fig 4

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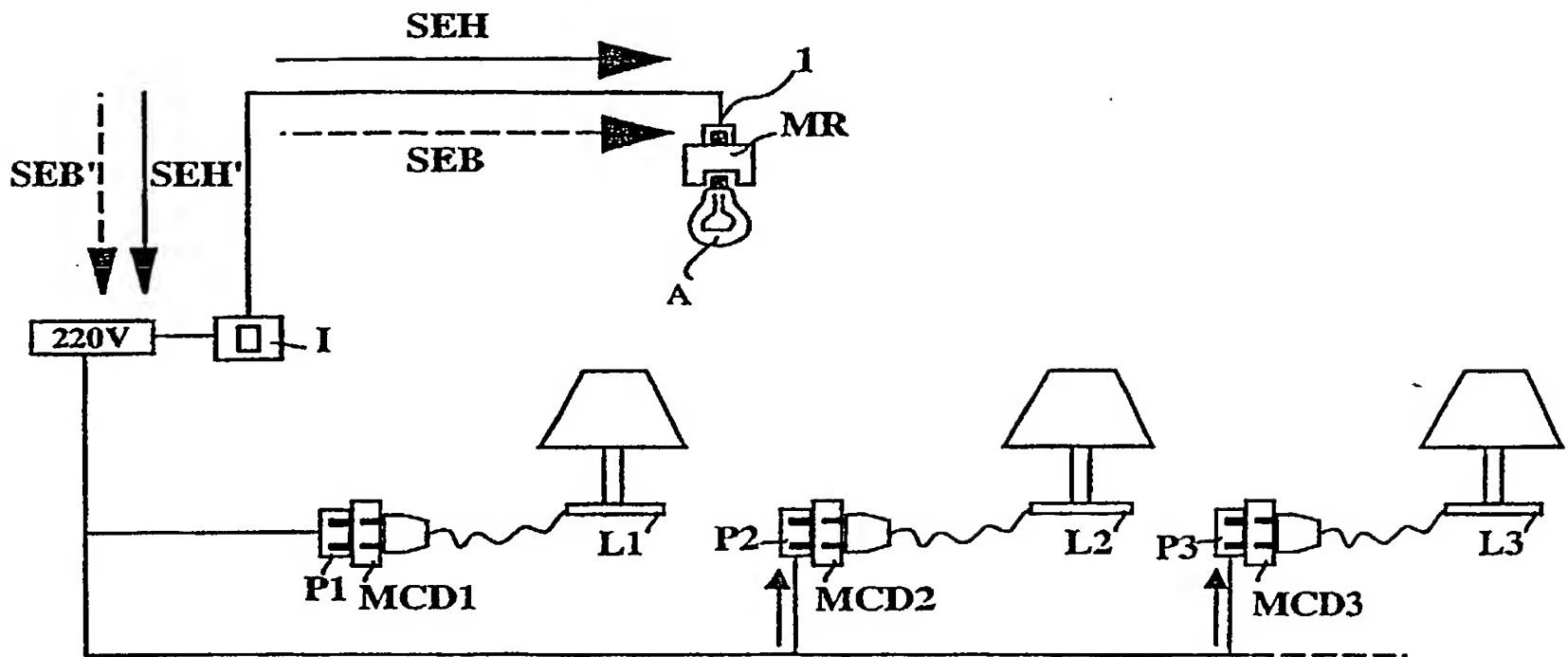


Fig 5

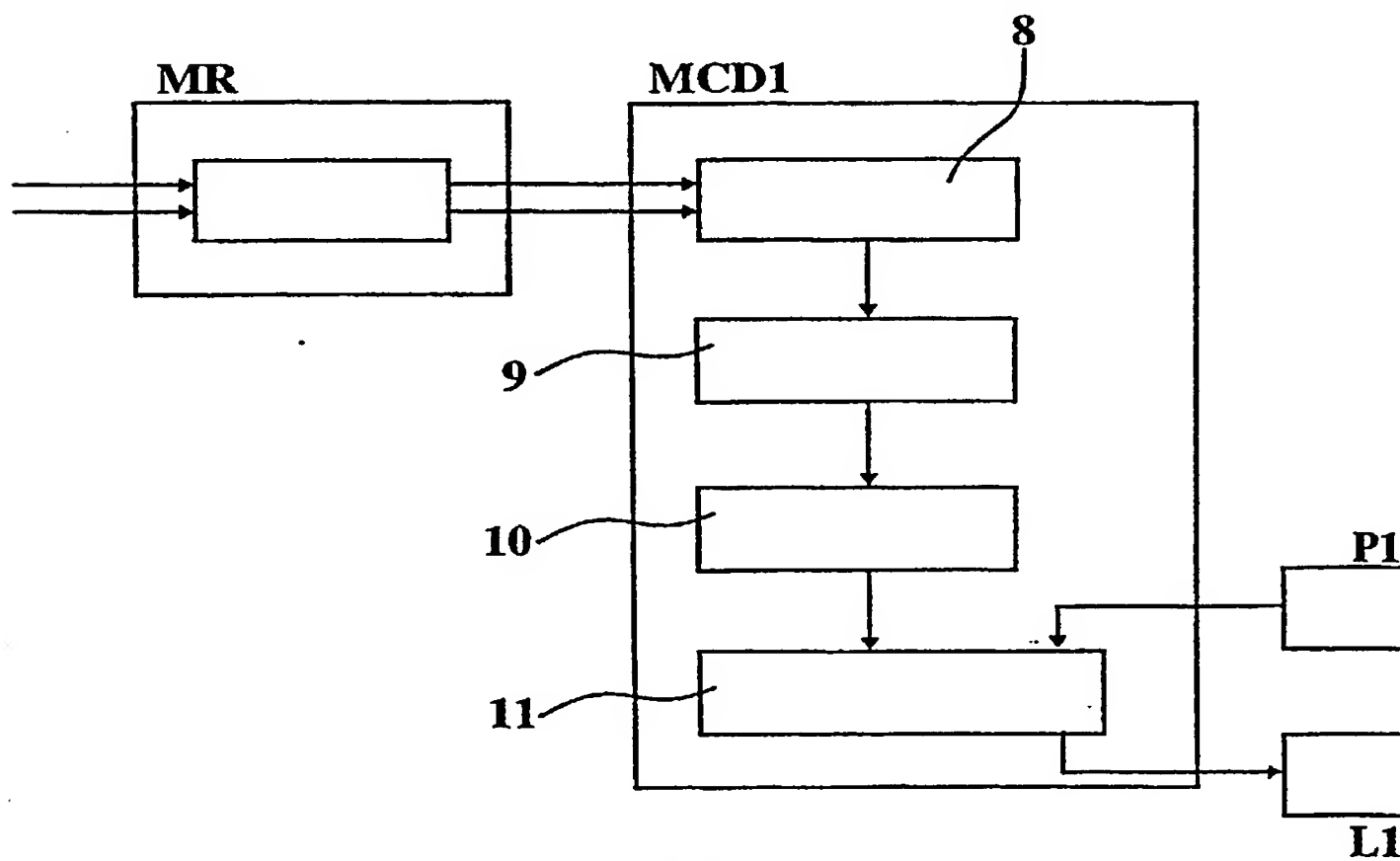
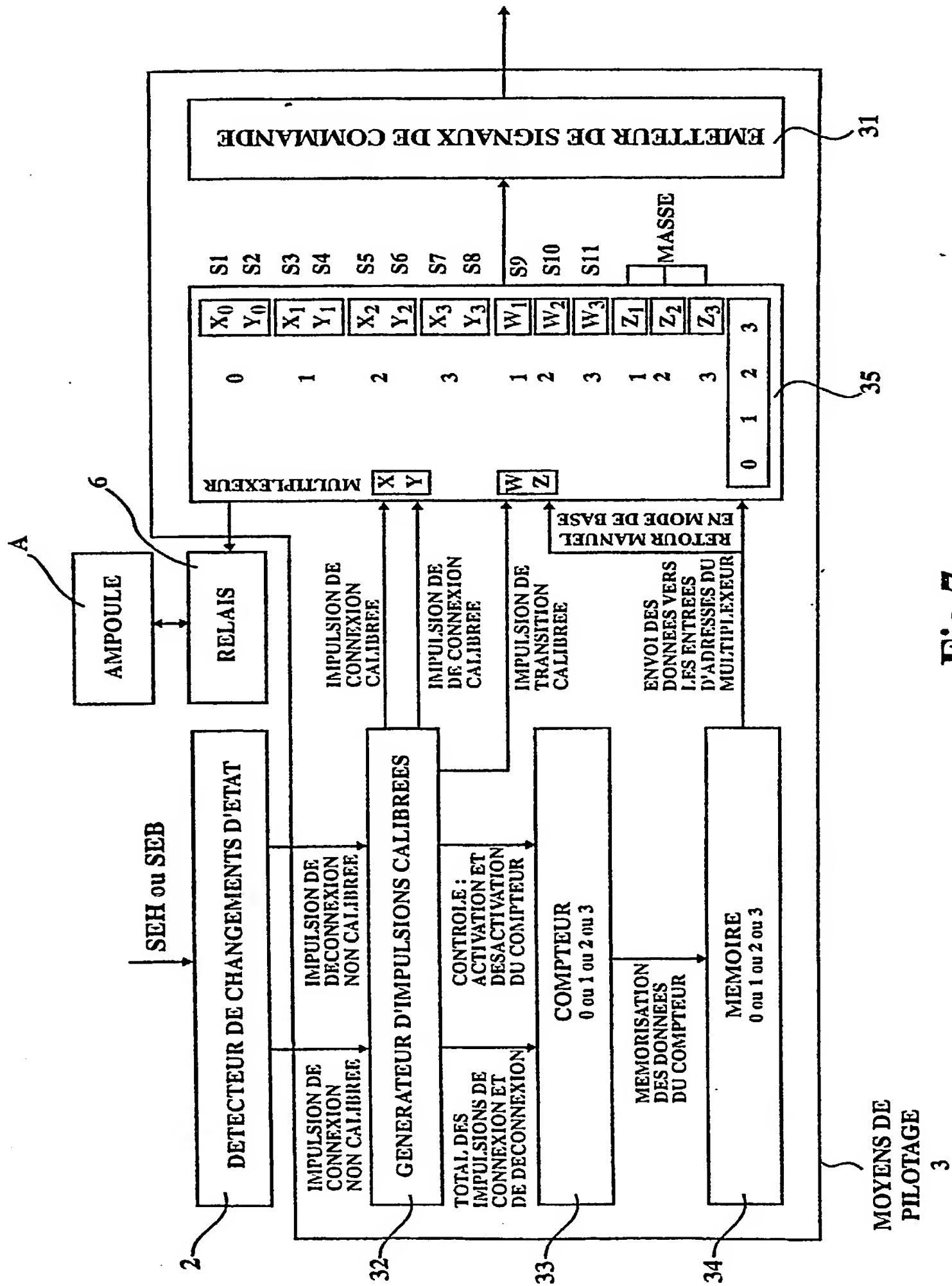


Fig 6



**Fig 7**

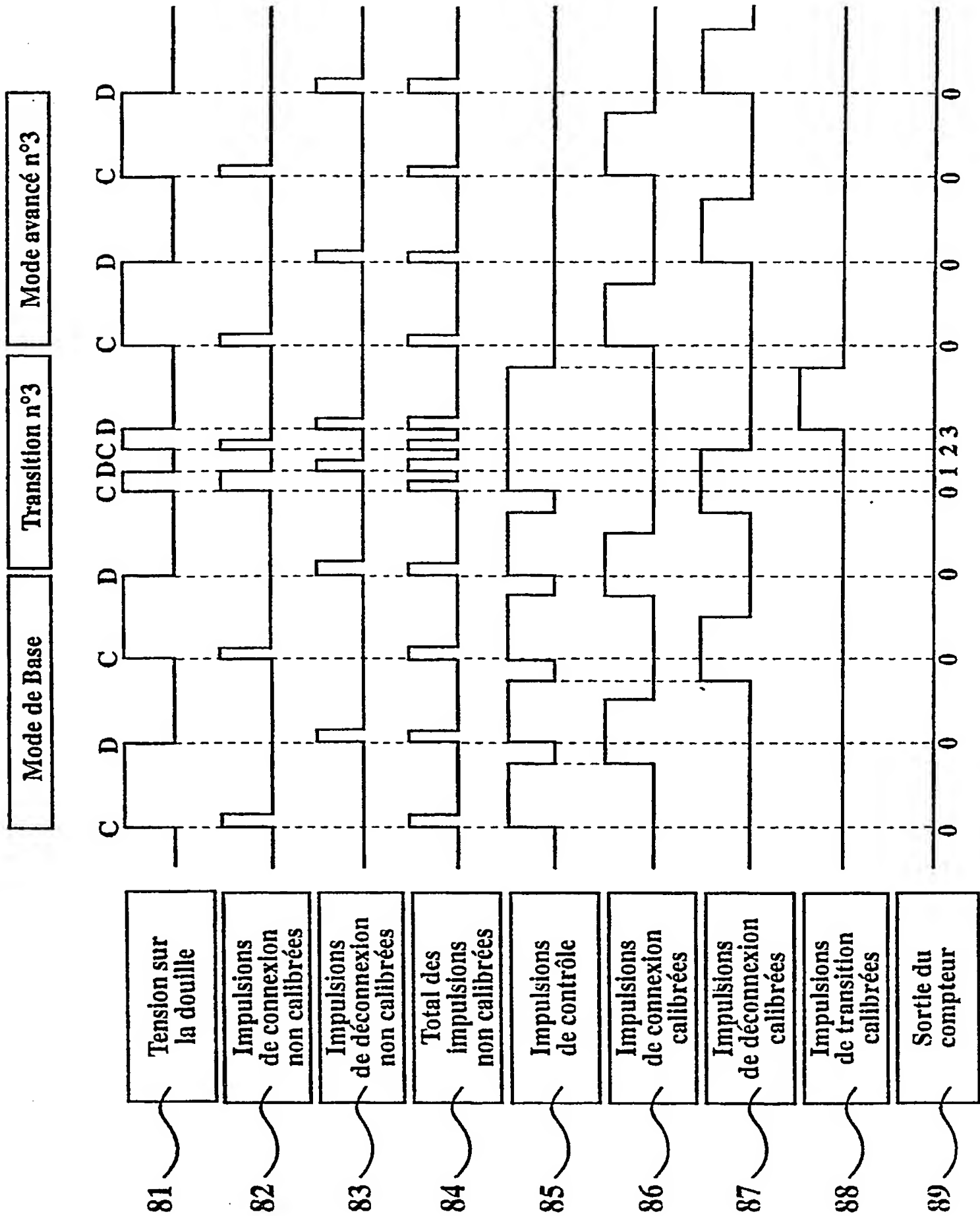


Fig 8

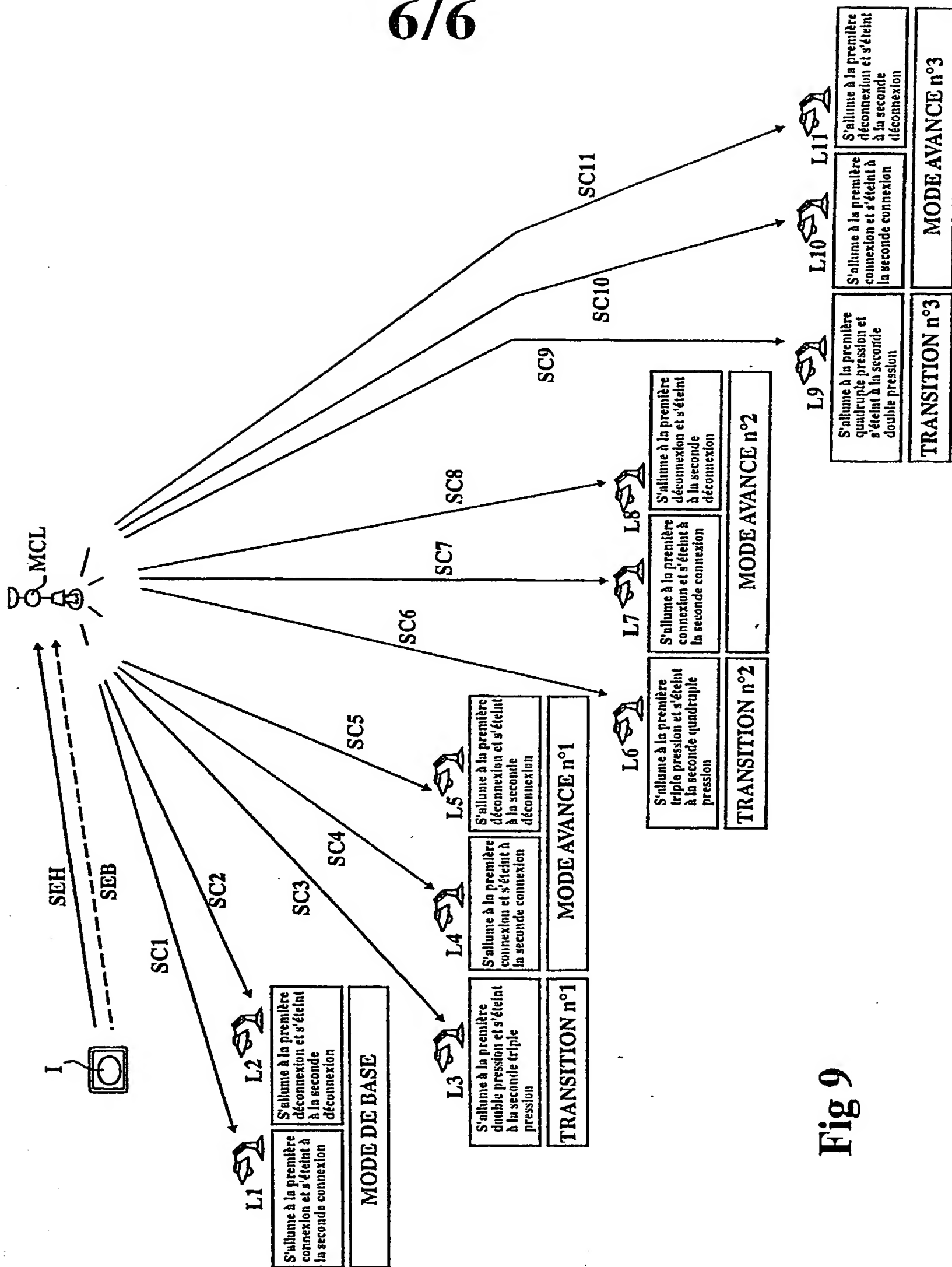
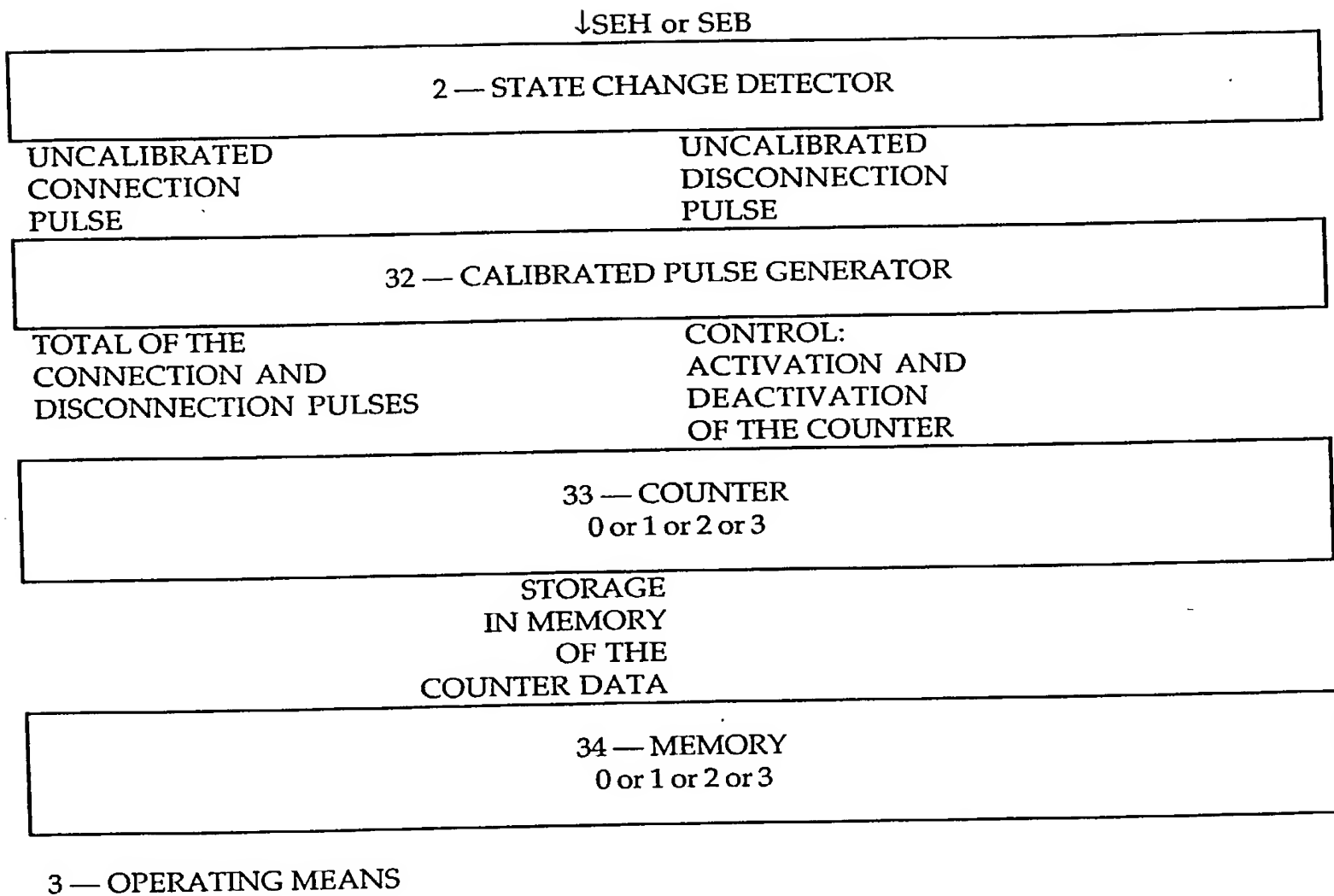


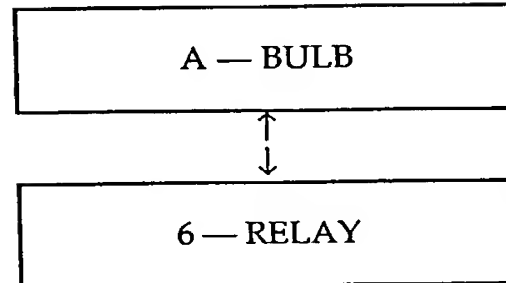
Fig 9

**Figure 7**  
Text at left:



**Figure 7**

Text at center:



CALIBRATED  
CONNECTION PULSE

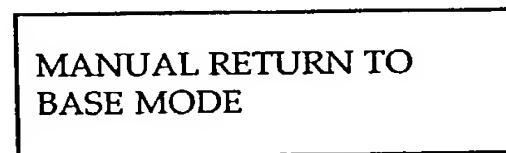
CALIBRATED  
DISCONNECTION PULSE

CALIBRATED  
TRANSITION PULSE

TRANSMISSION OF THE  
DATA TO THE ADDRESS  
INPUTS OF THE  
MULTIPLEXER

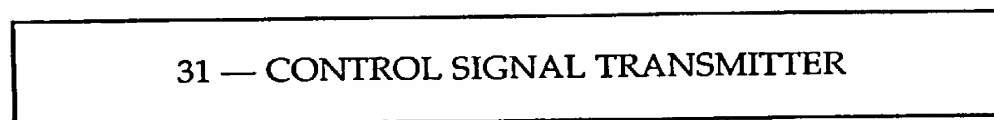
**Figure 7**

Text at right:



MULTIPLEXER

MASS





**Figure 8**

Text across top:

Base Mode	Transition No. 3	Advanced Mode No 3
-----------	------------------	--------------------

Text down left side:

81 — Voltage on the socket
82 — Uncalibrated connection pulses
83 — Uncalibrated disconnection pulses
84 — Total of the uncalibrated pulses
85 — Control pulses
86 — Calibrated connection pulses
87 — Calibrated disconnection pulses
88 — Calibrated transition pulses
89 — Counter output

**Figure 9**

Counterclockwise from top left:

L1	L2
Turned on upon the first connection and turned off upon the second connection	Turned on upon the first disconnection and turned off upon the second disconnection
BASE MODE	

L3	L4	L5
Turned on upon the first double tapping and turned off upon the second triple tapping	Turned on upon the first connection and turned off upon the second connection	Turned on upon the first disconnection and turned off upon the second disconnection
TRANSITION No. 1	ADVANCED MODE No. 1	

L6	L7	L8
Turned on upon the first triple tapping and turned off upon the second quadruple tapping	Turned on upon the first connection and turned off upon the second connection	Turned on upon the first disconnection and turned off upon the second disconnection
TRANSITION No. 2	ADVANCED MODE No. 2	

L9	L10	L11
Turned on upon the first quadruple tapping and turned off upon the second double tapping	Turned on upon the first connection and turned off upon the second connection	Turned on upon the first disconnection and turned off upon the second disconnection
TRANSITION No. 3	ADVANCED MODE No. 3	

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COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY  
(Includes Reference to PCT International Applications)

Attorney's Reference:  
PRIGENT1

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: REMOTE CONTROL SYSTEM FOR AT LEAST AN ELECTRICAL APPARATUS, AND MODULES COMPONENT MODULES OF SAID SYSTEM, the specification of which (check only one item below):

☐ is attached hereto.

☐ was filed as United States Patent

Application No. \_\_\_\_\_

on \_\_\_\_\_

and was amended

on \_\_\_\_\_ (if applicable).

☒ was filed as PCT International Application

Number PCT/FR00/02492

on 8 September 2000

and was amended under PCT Article 19

on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability, as defined in 37 C.F.R. 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 35 U.S.C. 365(b) of any foreign application(s) for patent or inventor's certificate, or under 35 U.S.C. 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate, or any PCT international application having a filing date before that of the application on which priority is claimed.

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. §119:

COUNTRY (if PCT, indicate "PCT")	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 U.S.C. §119
France	99/11706	15 September 1999	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or under 35 U.S.C. 365(c) of any PCT international application designating the United States of America, that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. 1.56 which became available between the filing date of the prior application(s) and the national or PCT international filing date of this application:

210099440 06.1.2002

PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. §120:

U.S. APPLICATIONS		STATUS (Check one)		
U.S. APPLICATION NUMBER	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
PCT APPLICATIONS DESIGNATING THE U.S.				
PCT APPLICATION NO.	PCT FILING DATE	U.S. SERIAL NUMBERS ASSIGNED (if any)		

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

GARY M. COHEN, ESQ. - Reg. No. 28,834

Send Correspondence to:  Gary M. Cohen, Esq. Strafford Building Number Three 125 Strafford Avenue, Suite 300 Wayne, PA 19102	Direct Telephone Calls to: (name and telephone number)  Gary M. Cohen, Esq. (610) 975-4430
---	--

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Full Name of Inventor 2	Family Name	First Given Name	Second Given Name	
	Residence & Citizenship	City	State or Foreign Country	Country of Citizenship
Post Office Address	Post Office Address	City	State/Zip Code/Country	

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signature of Inventor 1 ERVEN PRIGENT	Signature of Inventor 2
Date 22 APRIL 2002	Date

30083440 061802  
10/088.440

Applicant: PRIGENT, Erven Attorney's Ref.: PRIGENT1  
Application No.: 10/088.440  
Filed: (filing date not yet assigned)  
For: REMOTE CONTROL SYSTEM FOR AT LEAST AN ELECTRICAL  
APPARATUS, AND MODULES COMPONENT MODULES OF SAID SYSTEM

STATEMENT CLAIMING SMALL ENTITY STATUS  
(37 C.F.R. §1.9(f) and §1.27(c)) - SMALL BUSINESS CONCERN

I hereby state that I am

- ☐ the owner of the small business concern identified below:  
☒ an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF SMALL BUSINESS CONCERN: NOVATYS SAS  
ADDRESS OF SMALL BUSINESS CONCERN: BP 88, ZA de Ty Vougeret  
29150 Chateaulin, France

I hereby state that the above-identified small business concern qualifies as a small business concern as defined in 13 C.F.R. Part 121 for purposes of paying reduced fees to the United States Patent and Trademark Office. Questions related to size standards for a small business concern may be directed to: Small Business Administration, Size Standards Staff, 409 Third Street, S.W., Washington, D.C. 20416.

I hereby state that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention described in:

- ☐ the specification filed herewith, with title as listed above.  
☒ the application identified above.  
☐ the patent identified above.

If the rights held by the above-identified small business concern are not exclusive, each individual, concern or organization having rights in the invention must file separate statements as to their status as small entities, and no rights to the invention are held by any person, other than the inventor, who would not qualify as an independent inventor under 37 C.F.R. §1.9(c) if that person made the invention, or by any concern which would not qualify as a small business concern under 37 C.F.R. §1.9(d), or a nonprofit organization under 37 C.F.R. §1.9(e).

Each person, concern or organization having any rights in the invention is listed below:

- ☒ no such person, concern or organization exists.  
☐ each such person, concern or organization is listed below.

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

Separate statements are required from each named person, concern or organization having rights to the invention stating their status as small entities. (37 C.F.R. §1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 C.F.R. §1.28(b))

NAME OF PERSON SIGNING: PRIGENT, Erven  
TITLE OF PERSON IF OTHER THAN OWNER: President  
ADDRESS OF PERSON SIGNING: BP 88, ZA de Ty Vougeret  
29150 Chateaulin, France

SIGNATURE ERVEN PRIGENT

DATE 5 APRIL 2002